

AMG-18
Federation Management
Technical Exchange

Background - Technical Exchanges

- **HLA evolution is based on feedback from users**
- **Important to establish a mechanism for capturing user experiences in areas of specific interest**
 - **Technical exchanges are a mechanism to identify and explore potential issues**
 - **Share information on plans and results of issue investigations**
 - **Results are reported back to the AMG**

Federation Management Technical Exchanges

- **Third in series of technical exchange in federation management**
 - **First focused on issues of linking federations and federates with multiple connections to the RTI**
 - **Second focused on management object model and its use**
- **This technical exchange revisited the topics of the first technical exchange**
 - **To review progress to date based on work in progress**

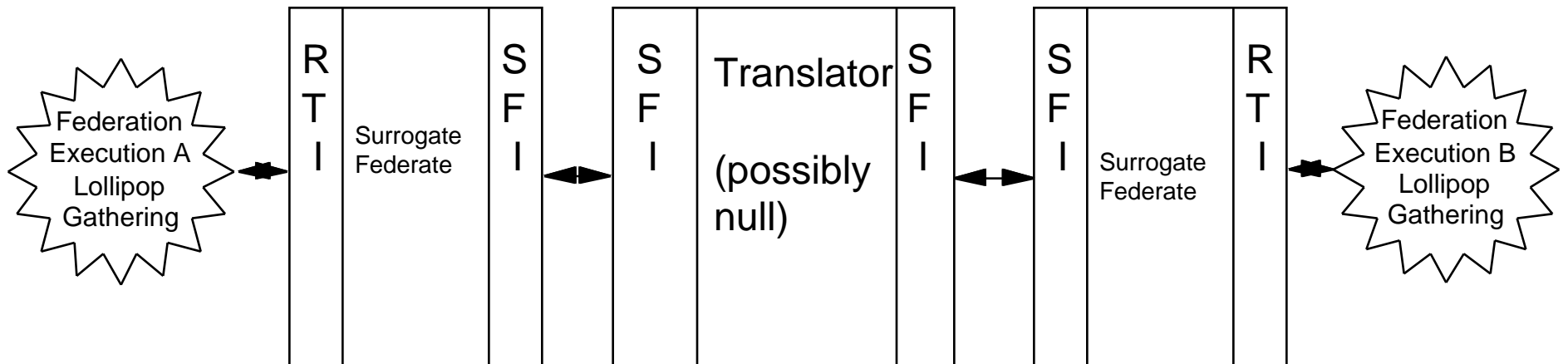
Federation Management technical Exchange

- **Held on 24 March, 1997 at DMSO**
- **~ 20 participants**
- **Two topics**
 - **Bridge federate**
 - **SEI presentation on functional analysis in progress (Reed Little)**
 - **Federates with multiple links to the RTI**
 - **Two examples**
 - **CCTT HLA prototype experience (Chris Bouwens)**
 - **SAF/TAOS federate in STOW federation (Paul Birkel)**

Bridge Federate

- **Bridge federate is a**
 - **Federate which participates in two federation executions and hence 'bridges' the two**
- **Uses of a bridge federate**
 - **Any multi "execution" exercises**
 - **Linking federation executions operating at different security levels**
 - **Linking executions using different RTI implementations**
 - **Combine federations with different time mechanisms**

Notional Bridge Architecture



Bridge Federate Functional Analysis Status

- **Beginning with two federation execution example**
- **Use case approach based on I/F Spec service classes**
 - Employed to determine Surrogate Federate and SFI requirements
 - In progress, first pass through IF spec expected by end of April
 - Update on progress planned for next federation technical exchange (29 April)
 - results may suggest IF Spec or MOM additions or changes
- **Currently documented in stylized English**
 - changing to event traces (suggested by SAIC)
- **Bridge federate analysis will provide basis for understanding requirements for 'guard federate' in security architecture (special case of bridge federate)**
- **Plans to follow functional analysis with prototype development to exercise bridge federate in different federation configurations (CCTT, MoDSAF, EAGLE candidate participants)**

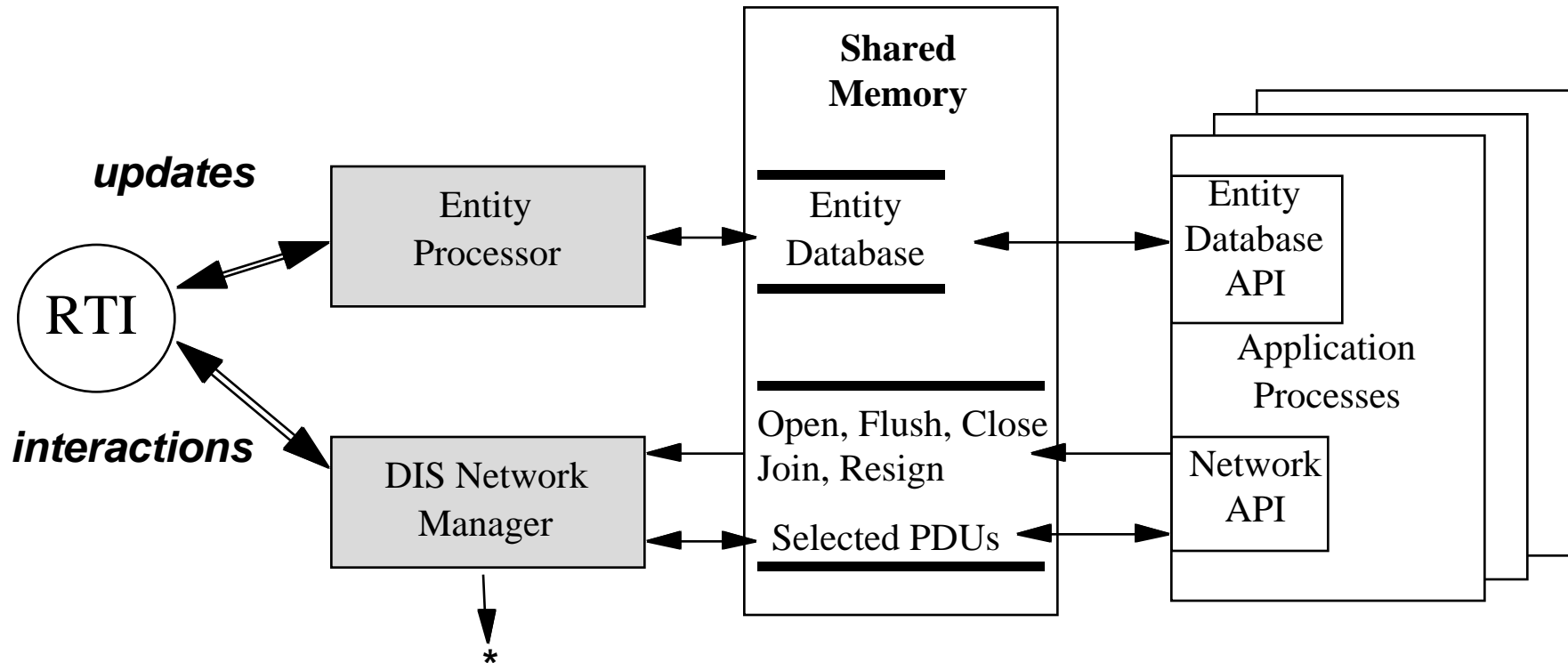
Intercommunication Messages

- request attribute ownership transfer (modeling execution object id, domestic string version of attribute, user tag)
- transfer attribute ownership approved (modeling execution object id, domestic string version of attribute, user tag)
- transfer attribute ownership denied (modeling execution object id, domestic string version of attribute, user tag)
- echo pause (label)
- echo-pause achieved (label)
- echo resume
- echo-resume achieved
- echo save (label)
- echo-save succeeded
- echo-save failed
- echo restore (label)
- echo-restore succeeded (label)
- echo-restore failed (label)
- echo discover object (modeling execution object id, domestic string version of object class, time, user_tag,
- originating execution copy of event retraction handle)
- echo attribute values update (modeling execution object id, (attribute name/value pair list with domestic string version of attribute names), time, user_tag, originating execution copy of event retraction handle)

Federates with Multiple Connections to the RTI

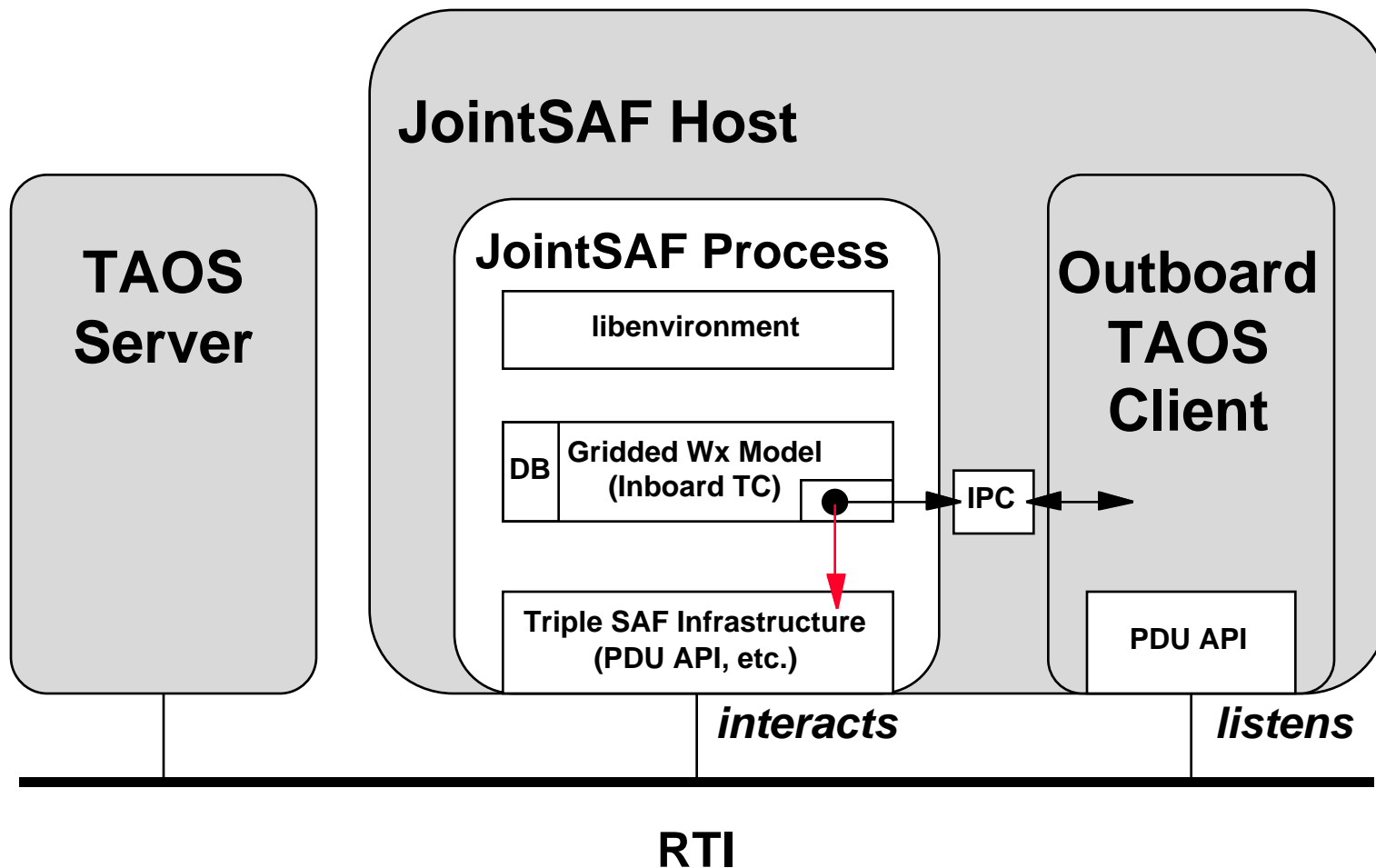
- **Two working examples presented**
 - CCTT-SAF prototype used in PPF
 - SAF-TAOS federate developed for STOW federation
- **Both examples**
 - Use current HLA IF specification satisfactorily
 - Each connection to the RTI implements federation join/declaration functionality
 - Are entirely 'realtime' (use receive order, not TSO)
 - Partition interface functionality between connections
 - SAF TAOS, one connection only listens, the other interacts
 - CCTT SAT, one connection handles interactions, the other attribute updates

CCTT HLA Prototype Architecture



** DIS connection in the prototype not shown here*

SAF/TAOS Federate



Federates with Multiple Connections

- **Raise issues with respect to definitions**
 - **Federates vs. RTI connections**
 - **Multiple connection federates or composite federates**
 - **Physical vs. logical federates**
- **Too few examples to generally address these issues very well**
- **Solicit input from AMG members and others to identify other examples of such configurations**
 - **Actual implementations**
 - **Plans for implementations**
- **Contact Reed Little (Little@sei.cmu.edu) or Rosemary Hsu (rhsu@dmso.mil)**

Next Steps

- **Next federation management technical exchange scheduled for 29 April at DMSO**
- **Topics include**
 - **Bridge federate functional analysis results**
 - **Update on MoM applications**
 - **Testing support (GTRI)**
 - **Federation Management Tools (FMT) (AEgis)**
 - **Other users?**
 - **Approaches to handling 'bulky' FOM data (e.g., videoteleconferencing or voice) via FOM tokens (MRCI)**
- **Other inputs requested on federates with multiple connections and on definitions**